

532622010700seq
SEQUENCE LISTING

<110> Plesch, Gunnar
Blau, Astrid
Daschner, Klaus
<120> Method for Identifying Herbicidally Active Substances
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<140> Not yet assigned
<141> 2005-02-15
<150> PCT/EP03/08393
<151> 2003-07-30

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<170> PatentIn version 3.1

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Lys Leu Arg Ala Thr Ala Trp Arg Phe Ala Phe Ser Ser Arg Ala Lys
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Ser Val Val Ala Met Ala Ala Asn Glu Glu Phe Thr Gly Asn Leu Lys
50 55 60

Arg Gln Leu Ala Lys Leu Phe Asp Val Ser Leu Lys Leu Thr Val Pro
65 70 75 80

Asp Glu Pro Ser Val Glu Pro Leu Val Ala Ala Ser Ala Leu Gly Lys
85 90 95

Phe Gly Asp Tyr Gln Cys Asn Asn Ala Met Gly Leu Trp Ser Ile Ile
100 105 110

Lys Gly Lys Gly Thr Gln Phe Lys Gly Pro Pro Ala Val Gly Gln Ala
115 120 125

Leu Val Lys Ser Leu Pro Thr Ser Glu Met Val Glu Ser Cys Ser Val
130 135 140

Ala Gly Pro Gly Phe Ile Asn Val Val Leu Ser Ala Lys Trp Met Ala
145 150 155 160

Lys Ser Ile Glu Asn Met Leu Ile Asp Gly Val Asp Thr Trp Ala Pro
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Thr Leu Ser Val Lys Arg Ala Val Val Asp Phe Ser Ser Pro Asn Ile
180 185 190

Ala Lys Glu Met His Val Gly His Leu Arg Ser Thr Ile Ile Gly Asp
195 200 205

Thr Leu Ala Arg Met Leu Glu Tyr Ser His Val Glu Val Leu Arg Arg
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Asn His Val Gly Asp Trp Gly Thr Gln Phe Gly Met Leu Ile Glu Tyr
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Leu Phe Glu Lys Phe Pro Asp Thr Asp Ser Val Thr Glu Thr Ala Ile
245 250 255

Gly Asp Leu Gln Val Phe Tyr Lys Ala Ser Lys His Lys Phe Asp Leu
260 265 270

Asp Glu Ala Phe Lys Glu Lys Ala Gln Gln Ala Val Val Arg Leu Gln
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Gly Gly Asp Pro Val Tyr Arg Lys Ala Trp Ala Lys Ile Cys Asp Ile
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Ser Arg Thr Glu Phe Ala Lys Val Tyr Gln Arg Leu Arg Val Glu Leu
305 310 315 320

Glu Glu Lys Gly Glu Ser Phe Tyr Asn Pro His Ile Ala Lys Val Ile
325 330 335

Glu Glu Leu Asn Ser Lys Gly Leu Val Glu Glu Ser Glu Gly Ala Arg
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Val Ile Phe Leu Glu Gly Phe Asp Ile Pro Leu Met Val Val Lys Ser
355 360 365

Asp Gly Gly Phe Asn Tyr Ala Ser Thr Asp Leu Thr Ala Leu Trp Tyr
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Arg Leu Asn Glu Glu Lys Ala Glu Trp Ile Ile Tyr Val Thr Asp Val
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Gly Gln Gln Gln His Phe Asn Met Phe Phe Lys Ala Ala Arg Lys Ala
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Gly Trp Leu Pro Asp Asn Asp Lys Thr Tyr Pro Arg Val Asn His Val
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Gly Phe Gly Leu Val Leu Gly Glu Asp Gly Lys Arg Phe Arg Thr Arg
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Ala Thr Asp Val Val Arg Leu Val Asp Leu Leu Asp Glu Ala Lys Thr
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Arg Ser Lys Leu Ala Leu Ile Glu Arg Gly Lys Asp Lys Glu Trp Thr
Page 21

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475

465 470 480

Pro Glu Glu Leu Asp Gln Thr Ala Glu Ala Val Gly Tyr Gly Ala Val
 485 490 495

Lys Tyr Ala Asp Leu Lys Asn Asn Arg Leu Thr Asn Tyr Thr Phe Ser
 500 505 510

Phe Asp Gln Met Leu Asn Asp Lys Gly Asn Thr Ala Val Tyr Leu Leu
 515 520 525

Tyr Ala His Ala Arg Ile Cys Ser Ile Ile Arg Lys Ser Gly Lys Asp
 530 535 540

Ile Asp Glu Leu Lys Lys Thr Gly Lys Leu Ala Leu Asp His Ala Asp
545 550 555 560

Glu Arg Ala Leu Gly Leu His Leu Leu Arg Phe Ala Glu Thr Val Glu
 565 570 575

Glu Ala Cys Thr Asn Leu Leu Pro Ser Val Leu Cys Glu Tyr Leu Tyr
 580 585 590

Asn Leu Ser Glu His Phe Thr Arg Phe Tyr Ser Asn Cys Gln Val Asn
 595 600 605

Gly Ser Pro Glu Glu Thr Ser Arg Leu Leu Leu Cys Glu Ala Thr Ala
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Lys Ile

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<211> 1491

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<213> Arabidopsis thaliana

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Ala Thr Thr Ser Ser Pro Thr Thr Glu Thr Asn Val Thr Asp Pro Asp
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Gln Leu Lys His Thr Ile Leu Leu Glu Arg Leu Arg Leu Arg His Leu
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Lys Glu Ser Ala Lys Pro Pro Gln Gln Arg Pro Ser Ser Val Val Gly
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Val Glu Glu Glu Ser Ser Ile Arg Lys Lys Ser Lys Lys Leu Val Glu
100 105 110

Asn Phe Gln Glu Leu Gly Leu Ser Glu Glu Val Met Gly Ala Leu Gln
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Glu Leu Asn Ile Glu Val Pro Thr Glu Ile Gln Cys Ile Gly Ile Pro
130 135 140

Ala Val Met Glu Arg Lys Ser Val Val Leu Gly Ser His Thr Gly Ser
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Gly Lys Thr Leu Ala Tyr Leu Leu Pro Ile Val Gln Val Leu Ser Glu
165 170 175

Leu Met Arg Glu Asp Glu Ala Asn Leu Gly Lys Lys Thr Lys Pro Arg

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Val Ser Gly Gly Ser Arg Ile Arg Pro Gln Glu Asp Ser Leu Asn Asn	225	230
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Glu Glu Gly Asn Met Val Tyr Gly Asp Ile Ala Tyr Leu Val Leu Asp	260	265
Glu Ala Asp Thr Met Phe Asp Arg Gly Phe Gly Pro Glu Ile Arg Lys	275	280
Phe Leu Ala Pro Leu Asn Gln His Ile Lys Val Val Asn Glu Ile Val	290	295
Ser Phe Gln Ala Val Gln Lys Leu Val Asp Glu Glu Phe Gln Gly Ile	305	310
Glu His Leu Arg Thr Ser Thr Leu His Lys Lys Ile Ala Asn Ala Arg	325	330
His Asp Phe Ile Lys Leu Ser Gly Gly Glu Asp Lys Leu Glu Ala Leu	340	345
Leu Gln Val Leu Glu Pro Ser Leu Ala Lys Gly Ser Lys Val Met Val	355	360
Phe Cys Asn Thr Leu Asn Ser Ser Arg Ala Val Asp His Tyr Leu Ser	370	375
Glu Asn Gln Ile Ser Thr Val Asn Tyr His Gly Glu Val Pro Ala Glu	385	390
Gln Arg Val Glu Asn Leu Lys Lys Phe Lys Asp Glu Glu Gly Asp Cys	405	410
Pro Thr Leu Val Cys Thr Asp Leu Ala Ala Arg Gly Leu Asp Leu Asp	420	425
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Val Asp His Val Val Met Phe Asp Phe Pro Lys Asn Ser Ile Asp Tyr
435 440 445

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tct cct acg tat tca aac aca gtc ttc ggt ttc aat caa acc aca tct	144
Ser Pro Thr Tyr Ser Asn Thr Val Phe Gly Phe Asn Gln Thr Thr Ser	
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ctc ggt cta aac cag ctc aca cct tac caa atc cac caa atc caa aac	192
Leu Gly Leu Asn Gln Leu Thr Pro Tyr Gln Ile His Gln Ile Gln Asn	
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cag ctt aac cag aga cgt aac ata atc tct cca aat cta gcc cca aag	240
Gln Leu Asn Gln Arg Arg Asn Ile Ile Ser Pro Asn Leu Ala Pro Lys	
65 70 75 80	

cct gtc cca atg aag aac atg acc gct cag aaa ctc tat aga gga gtt	288
Pro Val Pro Met Lys Asn Met Thr Ala Gln Lys Leu Tyr Arg Gly Val	
85 90 95	

aga caa agg cac tgg gga aaa tgg gta gct gag atc cgt tta ccc aag	336
Arg Gln Arg His Trp Gly Lys Trp Val Ala Glu Ile Arg Leu Pro Lys	

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gcc atg gct tat gac cta gct gct tac aag cta aga ggc gag ttc gcg Ala Met Ala Tyr Asp Leu Ala Ala Tyr Lys Leu Arg Gly Glu Phe Ala 130 135 140			432
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Ser Pro Thr Tyr Ser Asn Thr Val Phe Gly Phe Asn Gln Thr Thr Ser
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Leu Gly Leu Asn Gln Leu Thr Pro Tyr Gln Ile His Gln Ile Gln Asn
50 55 60

Gln Leu Asn Gln Arg Arg Asn Ile Ile Ser Pro Asn Leu Ala Pro Lys
65 70 75 80

Pro Val Pro Met Lys Asn Met Thr Ala Gln Lys Leu Tyr Arg Gly Val
85 90 95

Arg Gln Arg His Trp Gly Lys Trp Val Ala Glu Ile Arg Leu Pro Lys
100 105 110

Asn Arg Thr Arg Leu Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala
115 120 125

Ala Met Ala Tyr Asp Leu Ala Ala Tyr Lys Leu Arg Gly Glu Phe Ala
130 135 140

Arg Leu Asn Phe Pro Gln Phe Arg His Glu Asp Gly Tyr Tyr Gly Gly
145 150 155 160

Gly Ser Cys Phe Asn Pro Leu His Ser Ser Val Asp Ala Lys Leu Gln
165 170 175

Glu Ile Cys Gln Ser Leu Arg Lys Thr Glu Asp Ile Asp Leu Pro Cys
180 185 190

Ser Glu Thr Glu Leu Phe Pro Pro Lys Thr Glu Tyr Gln Glu Ser Glu
195 200 205

Tyr Gly Phe Leu Arg Ser Asp Glu Asn Ser Phe Ser Asp Glu Ser His
210 215 220

Val Glu Ser Ser Ser Pro Glu Ser Gly Ile Thr Thr Phe Leu Asp Phe
225 230 235 240

Ser Asp Ser Gly Phe Asp Glu Ile Gly Ser Phe Gly Leu Glu Lys Phe
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Val	Thr	Ala	Ile	Ser	Trp	Val	Lys	Tyr	Tyr	Phe	Glu	Glu	Ile	Tyr	Asp	
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gct Ala	caa Gln	ggg Gly	tcg Ser	ggc Gly 325	ttt Phe	gaa Glu	gct Ala	tcg Ser	caa Gln 330	gat Asp	gca Ala	ata Ile	aca Thr	gag Glu 335	tat Tyr	1008
aaa Lys	gtg Val	tta Leu	gga Gly 340	cct Pro	aag Lys	atc Ile	aac Asn	ggg Gly 345	tgt Cys	tcg Ser	tgg Trp	gta Val	gaa Glu 350	ctt Leu	cgt Arg	1056
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tac Tyr 385	ggg Gly	tgg Trp	ttt Phe	gtt Val	cac His 390	aag Lys	aga Arg	tgg Trp	aaa Lys	cag Gln 395	atg Met	cct Pro	cag Gln	gtt Val	gat Asp 400	1200
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ctt Leu	gat Asp	gtc Val	caa Gln	aag Lys	gga Gly	agc Ser	gtt Val	ttg Leu	tca Ser	aaa Lys	gta Val	cct Pro	ttg Leu	tta Leu	cat His	1296

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	435	440	445
gtc atg aac caa cag gaa aca gag ccg ctt cac aca gga atc att gat			1392
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	450	455	460
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Gly Lys Asn Ala Gly Ala Asp Gly Asp Asp Gly Asp Ser Gly Gly His	
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Lys Ala Ile Gln Thr His Phe Thr Lys Gly Leu Val Gln Met Glu Phe	
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 Trp Leu Pro Val Ser Ile Ala Glu Met Arg Ile Ser Lys Arg Tyr Asp
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 Leu Gln Arg Leu Val Arg Phe Lys Asp Ser Ala Ile Ile Val Leu Asn
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 Lys Pro Pro Lys Leu Pro Val Lys Gly Asn Val Pro Ile His Asn Ser
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 Met Asp Ala Leu Ala Ala Ala Ala Leu Ser Phe Gly Asn Asp Glu Gly
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 225 230 235 240
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 245 250 255
 Tyr Leu His Ser Val Phe Ser Asp Tyr Lys Gly Arg Asn Ser Ser Cys
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 Lys Ala Trp Asn Lys Ala Cys Glu Ala Met Tyr Gln Gln Tyr Trp Ala
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 325 330 335
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Val Met Asn Gln Gln Glu Thr Glu Pro Leu His Thr Gly Ile Ile Asp
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Gly Asn Arg Phe Tyr Ser Thr Ser Ala Glu Ala Ser His Ala Ser Ser		
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cct tcg ccg ttt ctt cac ggc ggc gga gct agc agg gtt gct ccg aaa		144
Pro Ser Pro Phe Leu His Gly Gly Gly Ala Ser Arg Val Ala Pro Lys		
35 40 45		

gat aga aat gtt cag tgg gtg ttt ttg gga tgt cct ggt gtt gga aaa		192
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Thr Cys Ser Gln Cys Gly Lys Gly Phe Asn Val Ala His Ile Asn Leu
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Lys Gly Glu Asn Gly Arg Pro Gly Ile Ser Met Asp Pro Leu Leu Pro
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Pro His Gln Cys Met Ser Lys Leu Val Thr Arg Ala Asp Asp Thr Glu
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Arg Ile Ser Leu Leu Pro Cys Arg Gly Phe Ser Ser Asp Glu Phe Pro
35 40 45

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Val Asp Glu Thr Phe Leu Glu Lys Phe Gly Pro Lys Asp Lys Asp Thr
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Lys Phe Asp Phe Pro Pro Ile Phe His Arg Asp Gly Asp Thr Asn Pro
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Asp Glu Ile Arg Arg Asp Cys Gly Arg Pro Pro Glu Pro Arg Lys Asp
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Pro Gly Ser Lys Pro Glu Glu Glu Gly Leu Leu Ser Asp His Pro Tyr
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Val Asp Lys Leu Trp Gln Ile His Val Ala Glu Gln Met Ile Leu Gly
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Asp Tyr Glu Ala Asn Pro Ala Lys Tyr Glu Gly Lys Lys Leu Ser Glu
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Val Gln Phe Cys Ala Pro Tyr Glu Val Gly Gly Gly Tyr Thr Asp Glu

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50

55

Glu Leu Phe Glu Arg Tyr Gly Thr Gln Gln Asn Gln Thr Asn Val Lys
65 70 75 80

Asp Lys Leu Asp Pro Ala Glu Tyr Glu Ala Leu Leu Lys Gly Gly Glu
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Gln Val Thr Ser Val Leu Glu Glu Met Ile Thr Leu Leu Glu Asp Met
100 105 110

Lys Met Asn Glu Ala Ser Glu Asn Val Ala Val Glu Leu Ala Ala Gln
115 120 125

Gly Val Ile Gly Lys Arg Val Asp Glu Met Glu Ser Gly Phe Met Met
130 135 140

Ala Leu Asp Tyr Met Ile Gln Leu Ala Asp Lys Asp Gln Asp Glu Lys
145 150 155 160

Val Gln Val Ile Gly Leu Leu Cys Arg Thr Pro Lys Lys Glu Ser Arg
165 170 175

His Glu Leu Leu Arg Arg Val Ala Ala Gly Gly Gly Ala Phe Glu Ser
180 185 190

Glu Asn Gly Thr Lys Leu His Ile Pro Gly Ala Asn Leu Asn Asp Ile
195 200 205

Ala Asn Gln Ala Asp Asp Leu Leu Glu Thr Met Glu Thr Arg Pro Ala
210 215 220

Ile Pro Asp Arg Lys Leu Leu Ala Arg Leu Val Leu Ile Arg Glu Glu
225 230 235 240

Ala Arg Asn Met Met Gly Gly Gly Ile Leu Asp Glu Arg Asn Asp Arg
245 250 255

Gly Phe Thr Thr Leu Pro Glu Ser Glu Val Asn Phe Leu Ala Lys Leu
260 265 270

Val Ala Leu Lys Pro Gly Lys Thr Val Gln Gln Met Ile Gln Asn Val
275 280 285

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Ser Ser Thr Glu Gly Arg Lys Pro Ser Gly Leu Asn Gly Arg Gly Ser
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Val Thr Gly Arg Lys Pro Leu Pro Val Arg Pro Gly Met Phe Leu Glu
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Ser Asn Asn Ala Lys Pro Arg Ile His Ser Ser Gly Ser Leu Gly Gly	
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atc aaa agc caa aat aga gtc tct cca ttg agt gcg gtt gga tta agc	144
Ile Lys Ser Gln Asn Arg Val Ser Pro Leu Ser Ala Val Gly Leu Ser	
35 40 45	

tca ggc ctt gga agt aga agg aaa tct ctt ttg ata tgt cac tca gcc	192
Ser Gly Leu Gly Ser Arg Arg Lys Ser Leu Leu Ile Cys His Ser Ala	
50 55 60	

att aac gcg aaa tgc agt gaa gga caa aca cag acc gtt act cgg gag	240
Ile Asn Ala Lys Cys Ser Glu Gly Gln Thr Gln Thr Val Thr Arg Glu	
65 70 75 80	

tca ccg act ata aca cag gct cct gta cac tct aag gag aaa tca cca	288
Ser Pro Thr Ile Thr Gln Ala Pro Val His Ser Lys Glu Lys Ser Pro	
85 90 95	

agc cta gac gat gga gga gac ggg ttc cca ccg cga gat gat gga gat	336
Ser Leu Asp Asp Gly Gly Asp Gly Phe Pro Pro Arg Asp Asp Gly Asp	

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ggt ggt gga gga gga ggg ggt gga ggc aac tgg tcg ggt ggg ttc ttc			384
Gly Gly Gly Gly Gly Gly Gly Gly Gly Asn Trp Ser Gly Gly Phe Phe			
115	120	125	
ttc ttt ggt ttt ctg gcc ttc ttg ggt cta ttg aag gat aaa gag ggc			432
Phe Phe Gly Phe Leu Ala Phe Leu Gly Leu Leu Lys Asp Lys Glu Gly			
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35 40 45

Ser Gly Leu Gly Ser Arg Arg Lys Ser Leu Leu Ile Cys His Ser Ala
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Ser Pro Thr Ile Thr Gln Ala Pro Val His Ser Lys Glu Lys Ser Pro
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Ser Leu Asp Asp Gly Gly Asp Gly Phe Pro Pro Arg Asp Asp Gly Asp
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Gly Gly Gly Gly Gly Gly Gly Gly Gly Asn Trp Ser Gly Gly Phe Phe
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ctc	gct	att	ggt	atc	tta	ggt	cca	gct	tta	tca	gct	ttt	gga	ttt	cta	288
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Gln	Thr	Arg	Lys	Val	Ile	Pro	Pro	Leu	Ala	Gly	Val	Asp	Val	Thr	Pro	
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Tyr Ala Pro Ala Ala Met Ala Ala Val Glu Phe Ala Thr Ala Ala Ala							
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gcc tgc ggt gat gaa acg aac aga cta att ata atc gag tcg aga ttc							624
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Phe Ile Leu Arg Ile Val Met Ser Trp Tyr Pro Lys Leu Pro Val Asp							
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130 135 140

Val Val Trp Phe Gly Leu Val Val Ala Ala Ala Asp Ala Tyr Glu
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Ile Val Arg Phe Val Ala Ala Ser Thr Cys Ala Ala Thr Lys Arg Thr
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Tyr Ala Pro Ala Ala Met Ala Ala Val Glu Phe Ala Thr Ala Ala Ala
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Gly	Asn	Thr	Val	Lys	Leu	Gly	Val	Ser	Gly	Cys	Ser	Ser	Cys	Ser	Arg	
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Ser	Asp	Ser	Glu	Leu	Arg	Glu	Arg	Thr	Asp	Ala	Leu	Lys	Gln	Arg	Ala				
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Gly	Leu	Lys	Val	Gly	Leu	Ile	Gln	Gln	Asn	Met	Thr	Pro	Glu	Gln	Arg				
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Lys	Glu	Asn	Tyr	Leu	Cys	Asp	Ile	Thr	Tyr	Val	Thr	Asn	Ser	Glu	Leu				
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Gln	Gly	Arg	Arg	Trp	Ser	Asp	Gly	Leu	His	Gln	Ala	Val	Glu	Ala	Lys	
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Tyr	Gln	Asn	Phe	Phe	Leu	Gln	Phe	Pro	Lys	Leu	Cys	Gly	Met	Thr	Gly	
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gag	atc	tct	aga	atg	cac	aag	aca	ggg	agg	gct	gtg	cta	gtt	ggc	aca	1536
Glu	Ile	Ser	Arg	Met	His	Lys	Thr	Gly	Arg	Ala	Val	Leu	Val	Gly	Thr	
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Thr	Ser	Val	Glu	Gln	Ser	Asp	Glu	Leu	Ser	Gln	Leu	Leu	Arg	Glu	Ala	
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aaa ctg agg act gca ttt ctg gcg ata gcg aaa gaa tat aag ggc tac Lys Leu Arg Thr Ala Phe Leu Ala Ile Ala Lys Glu Tyr Lys Gly Tyr 675 680 685	2064
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act aaa gct cta gat gaa gct cag aga aaa gtt gag aat tac ttc ttt Thr Lys Ala Leu Asp Glu Ala Gln Arg Lys Val Glu Asn Tyr Phe Phe 770 775 780	2352
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ctc act ccc gat ttg ctg aaa agc gaa gga tca agt tat gaa ggg ttg Leu Thr Pro Asp Leu Leu Lys Ser Glu Gly Ser Ser Tyr Glu Gly Leu 865 870 875 880	2640
caa gat tat ctc cgt gcc cgt ggc cgc gat gca tac tta cag aaa aga Gln Asp Tyr Leu Arg Ala Arg Gly Arg Asp Ala Tyr Leu Gln Lys Arg 885 890 895	2688
gaa atc gtg gag aaa caa tca cca ggg cta atg aaa gat gcc gaa cga Glu Ile Val Glu Lys Gln Ser Pro Gly Leu Met Lys Asp Ala Glu Arg 900 905 910	2736
ttc tta atc ttg agc aat att gat agg tta tgg aaa gaa cac ctt caa Phe Leu Ile Leu Ser Asn Ile Asp Arg Leu Trp Lys Glu His Leu Gln 915 920 925	2784
gca ctc aag ttc gtg caa caa gct gtg ggg ctc aga gga tat gcg caa Ala Leu Lys Phe Val Gln Gln Ala Val Gly Leu Arg Gly Tyr Ala Gln 930 935 940	2832
cgc gat cca ctc atc gag tat aag ctc gaa gga tac aat cta ttt ctg Arg Asp Pro Leu Ile Glu Tyr Lys Leu Glu Gly Tyr Asn Leu Phe Leu 945 950 955 960	2880
gaa atg atg gct caa ata cga aga aat gtg ata tac tcc ata tat cag Glu Met Met Ala Gln Ile Arg Arg Asn Val Ile Tyr Ser Ile Tyr Gln 965 970 975	2928
ttt caa cca gtg cgg gta aag aag gac gaa gag aag aag tct cag aac Phe Gln Pro Val Arg Val Lys Lys Asp Glu Glu Lys Lys Ser Gln Asn 980 985 990	2976
ggg aaa ccg agc aaa caa gta gat aat gct agt gag aag cct aaa caa Gly Lys Pro Ser Lys Gln Val Asp Asn Ala Ser Glu Lys Pro Lys Gln 995 1000 1005	3024
gtt ggt gtc aca gat gag cca tcc tca att gca agc gcc taa Val Gly Val Thr Asp Glu Pro Ser Ser Ile Ala Ser Ala 1010 1015 1020	3066

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Ile Leu Ile Asp Glu Ala Arg Thr Pro Leu Ile Ile Ser Gly Pro Ala
 290 295 300

Glu Lys Pro Ser Asp Gln Tyr Tyr Lys Ala Ala Lys Ile Ala Ser Ala
 305 310 315 320

Phe Glu Arg Asp Ile His Tyr Thr Val Asp Glu Lys Gln Lys Thr Val
 325 330 335

Leu Leu Thr Glu Gln Gly Tyr Glu Asp Ala Glu Glu Ile Leu Asp Val
 340 345 350

Lys Asp Leu Tyr Asp Pro Arg Glu Gln Trp Ala Ser Tyr Val Leu Asn
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Ala Ile Lys Ala Lys Glu Leu Phe Leu Arg Asp Val Asn Tyr Ile Ile
 370 375 380

Arg Ala Lys Glu Val Leu Ile Val Asp Glu Phe Thr Gly Arg Val Met
 385 390 395 400

Gln Gly Arg Arg Trp Ser Asp Gly Leu His Gln Ala Val Glu Ala Lys
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Glu Gly Leu Pro Ile Gln Asn Glu Ser Ile Thr Leu Ala Ser Ile Ser
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Tyr Gln Asn Phe Phe Leu Gln Phe Pro Lys Leu Cys Gly Met Thr Gly
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Thr Ala Ser Thr Glu Ser Ala Glu Phe Glu Ser Ile Tyr Lys Leu Lys
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Val Thr Ile Val Pro Thr Asn Lys Pro Met Ile Arg Lys Asp Glu Ser
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Asp Val Val Phe Lys Ala Val Asn Gly Lys Trp Arg Ala Val Val Val
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Glu Ile Ser Arg Met His Lys Thr Gly Arg Ala Val Leu Val Gly Thr
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Glu Ala Glu Ile Val Ala Gln Ser Gly Arg Leu Gly Ala Val Thr Ile
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Ala Thr Asn Met Ala Gly Arg Gly Thr Asp Ile Ile Leu Gly Gly Asn
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Ala Glu Phe Met Ala Arg Leu Lys Leu Arg Glu Ile Leu Met Pro Arg
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Val Val Lys Pro Thr Asp Gly Val Phe Val Ser Val Lys Lys Ala Pro
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Pro Lys Arg Thr Trp Lys Val Asn Glu Lys Leu Phe Pro Cys Lys Leu
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Ser Asn Glu Lys Ala Lys Leu Ala Glu Glu Ala Val Gln Ser Ala Val
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Glu Ala Trp Gly Gln Lys Ser Leu Thr Glu Leu Glu Ala Glu Glu Arg
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Thr Glu Arg His Glu Ser Arg Arg Ile Asp Asn Gln Leu Arg Gly Arg
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Ser Gly Arg Gln Gly Asp Pro Gly Ser Ser Arg Phe Phe Leu Ser Leu
725 730 735

Glu Asp Asn Ile Phe Arg Ile Phe Gly Gly Asp Arg Ile Gln Gly Met
740 745 750

Met Arg Ala Phe Arg Val Glu Asp Leu Pro Ile Glu Ser Lys Met Leu
755 760 765

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 Asp Ile Arg Lys Gln Leu Phe Glu Phe Asp Glu Val Leu Asn Ser Gln
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 Arg Asp Arg Val Tyr Thr Glu Arg Arg Arg Ala Leu Val Ser Asp Ser
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 Leu Glu Pro Leu Ile Ile Glu Tyr Ala Glu Leu Thr Met Asp Asp Ile
 820 825 830
 Leu Glu Ala Asn Ile Gly Pro Asp Thr Pro Lys Glu Ser Trp Asp Phe
 835 840 845
 Glu Lys Leu Ile Ala Lys Val Gln Gln Tyr Cys Tyr Leu Leu Asn Asp
 850 855 860
 Leu Thr Pro Asp Leu Leu Lys Ser Glu Gly Ser Ser Tyr Glu Gly Leu
 865 870 875 880
 Gln Asp Tyr Leu Arg Ala Arg Gly Arg Asp Ala Tyr Leu Gln Lys Arg
 885 890 895
 Glu Ile Val Glu Lys Gln Ser Pro Gly Leu Met Lys Asp Ala Glu Arg
 900 905 910
 Phe Leu Ile Leu Ser Asn Ile Asp Arg Leu Trp Lys Glu His Leu Gln
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 Ala Leu Lys Phe Val Gln Gln Ala Val Gly Leu Arg Gly Tyr Ala Gln
 930 935 940
 Arg Asp Pro Leu Ile Glu Tyr Lys Leu Glu Gly Tyr Asn Leu Phe Leu
 945 950 955 960
 Glu Met Met Ala Gln Ile Arg Arg Asn Val Ile Tyr Ser Ile Tyr Gln
 965 970 975
 Phe Gln Pro Val Arg Val Lys Lys Asp Glu Glu Lys Lys Ser Gln Asn
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1015

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Phe	Arg	Cys	Arg	Thr	Tyr	Ile	Phe	Ser	Phe	Ser	Ser	Ser	Pro	Leu	Cys	
		20						25					30			

tta	tat	ttc	ccg	cgc	ggt	gac	tct	act	tct	ctc	agg	cca	cga	gtt	cgc	144
Leu	Tyr	Phe	Pro	Arg	Gly	Asp	Ser	Thr	Ser	Leu	Arg	Pro	Arg	Val	Arg	
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gcc	ttg	cga	acg	gaa	tct	gac	ggt	gct	aaa	atc	ggt	aac	tcg	gag	tct	192
Ala	Leu	Arg	Thr	Glu	Ser	Asp	Gly	Ala	Lys	Ile	Gly	Asn	Ser	Glu	Ser	
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Tyr	Gly	Ser	Glu	Leu	Leu	Arg	Arg	Pro	Arg	Ile	Ala	Ser	Glu	Glu	Ser	
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tcc	gaa	gaa	gag	gag	gaa	gag	gaa	gaa	gag	aac	agc	gaa	ggt	gat	gag	288
Ser	Glu	Glu	Glu	Glu	Glu	Glu	Glu	Glu	Glu	Asn	Ser	Glu	Gly	Asp	Glu	
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ttc	gtc	gat	tgg	gaa	gat	aaa	atc	ctt	gag	gtt	act	gtt	cct	ctt	gtt	336
Phe	Val	Asp	Trp	Glu	Asp	Lys	Ile	Leu	Glu	Val	Thr	Val	Pro	Leu	Val	
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ggc	ttc	gtc	aga	atg	att	ctt	cac	tcc	gga	aaa	tat	gca	aac	cga	gat	384
Gly	Phe	Val	Arg	Met	Ile	Leu	His	Ser	Gly	Lys	Tyr	Ala	Asn	Arg	Asp	
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agg	cta	agc	ccc	gag	cat	gag	aga	aca	att	att	gag	atg	cta	ctt	cct	432
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tat	cat	cct	gaa	tgt	gag	aag	aag	atc	gga	tgt	ggt	ata	gac	tat	att	480
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Met Val Gly His His Pro Asp Phe Glu Ser Ser Arg Cys Met Phe Ile	
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	170
	175
gtt cga aaa gat gga gaa gta gtc gac ttt tcg tat tgg aaa tgc ata	576
Val Arg Lys Asp Gly Glu Val Val Asp Phe Ser Tyr Trp Lys Cys Ile	
	180
	185
	190
aaa ggt ctt ata aaa aag aag tat cct ctg tat gca gac agt ttc atc	624
Lys Gly Leu Ile Lys Lys Lys Tyr Pro Leu Tyr Ala Asp Ser Phe Ile	
	195
	200
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Ala Leu Arg Thr Glu Ser Asp Gly Ala Lys Ile Gly Asn Ser Glu Ser	
50 55 60	
Tyr Gly Ser Glu Leu Leu Arg Arg Pro Arg Ile Ala Ser Glu Glu Ser	
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ser Glu Glu Glu Glu Glu Glu Glu Glu Glu Asn Ser Glu Gly Asp Glu	
85 90 95	
Phe Val Asp Trp Glu Asp Lys Ile Leu Glu Val Thr Val Pro Leu Val	
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Gly Phe Val Arg Met Ile Leu His Ser Gly Lys Tyr Ala Asn Arg Asp	
115 120 125	
Arg Leu Ser Pro Glu His Glu Arg Thr Ile Ile Glu Met Leu Leu Pro	

130

135

Tyr His Pro Glu Cys Glu Lys Lys Ile Gly Cys Gly Ile Asp Tyr Ile
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Met Val Gly His His Pro Asp Phe Glu Ser Ser Arg Cys Met Phe Ile
165 170 175

Val Arg Lys Asp Gly Glu Val Val Asp Phe Ser Tyr Trp Lys Cys Ile
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aag ctc cgt ttc tcc gcc gat cat ctg act ttt acc acc gtg aca gaa 96
Lys Leu Arg Phe Ser Ala Asp His Leu Thr Phe Thr Thr Val Thr Glu
20 25 30

aaa ttg aga gca acg gct tgg aga ttt gct ttc tca tcc aga gct aag 144
Lys Leu Arg Ala Thr Ala Trp Arg Phe Ala Phe Ser Ser Arg Ala Lys
35 40 45

tcc gtg gta gca atg gca gct aat gaa gaa ttt acg gga aat ctg aaa 192
Ser Val Val Ala Met Ala Ala Asn Glu Glu Phe Thr Gly Asn Leu Lys
50 55 60

cgt caa ctc gcg aag ctc ttt gat gtt tct cta aaa tta acg gtt cct 240
Arg Gln Leu Ala Lys Leu Phe Asp Val Ser Leu Lys Leu Thr Val Pro
65 70 75 80

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aaa gga aag ggt act cag ttc aag ggt cct cca gct gtt gga cag gcc Lys Gly Lys Gly Thr Gln Phe Lys Gly Pro Pro Ala Val Gly Gln Ala 115 120 125	384
ctt gtt aag agt ctc cct act tct gag atg gta gaa tca tgc tct gta Leu Val Lys Ser Leu Pro Thr Ser Glu Met Val Glu Ser Cys Ser Val 130 135 140	432
gct gga cct ggc ttt att aat gtt gta cta tca gct aag tgg atg gct Ala Gly Pro Gly Phe Ile Asn Val Val Leu Ser Ala Lys Trp Met Ala 145 150 155 160	480
aag agt att gaa aat atg ctc atc gat gga gtt gac aca tgg gca cct Lys Ser Ile Glu Asn Met Leu Ile Asp Gly Val Asp Thr Trp Ala Pro 165 170 175	528
act ctt tcg gtt aag aga gct gta gtt gat ttt tcc tct ccc aac att Thr Leu Ser Val Lys Arg Ala Val Val Asp Phe Ser Ser Pro Asn Ile 180 185 190	576
gca aaa gaa atg cat gtt ggt cat cta aga tca act atc att ggt gac Ala Lys Glu Met His Val Gly His Leu Arg Ser Thr Ile Ile Gly Asp 195 200 205	624
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gga gat ctt cag gtg ttt tac aag gca tca aaa cat aaa ttt gat ctg Gly Asp Leu Gln Val Phe Tyr Lys Ala Ser Lys His Lys Phe Asp Leu 260 265 270	816
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gaa gaa aag gga gaa agc ttt tac aac cct cat att gct aaa gta att Glu Glu Lys Gly Glu Ser Phe Tyr Asn Pro His Ile Ala Lys Val Ile	1008

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325				330				335								
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gat	ggt	ggt	ttt	aac	tat	gcc	tca	aca	gat	ctg	act	gct	ctt	tgg	tac	1152
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Arg	Leu	Asn	Glu	Glu	Lys	Ala	Glu	Trp	Ile	Ile	Tyr	Val	Thr	Asp	Val	
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Gly	Gln	Gln	Gln	His	Phe	Asn	Met	Phe	Phe	Lys	Ala	Ala	Arg	Lys	Ala	
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Gly	Trp	Leu	Pro	Asp	Asn	Asp	Lys	Thr	Tyr	Pro	Arg	Val	Asn	His	Val	
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Gly	Phe	Gly	Leu	Val	Leu	Gly	Glu	Asp	Gly	Lys	Arg	Phe	Arg	Thr	Arg	
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Pro	Glu	Glu	Leu	Asp	Gln	Thr	Ala	Glu	Ala	Val	Gly	Tyr	Gly	Ala	Val	
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Lys	Tyr	Ala	Asp	Leu	Lys	Asn	Asn	Arg	Leu	Thr	Asn	Tyr	Thr	Phe	Ser	
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Phe	Asp	Gln	Met	Leu	Asn	Asp	Lys	Gly	Asn	Thr	Ala	Val	Tyr	Leu	Leu	
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Tyr	Ala	His	Ala	Arg	Ile	Cys	Ser	Ile	Ile	Arg	Lys	Ser	Gly	Lys	Asp	
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Ile	Asp	Glu	Leu	Lys	Lys	Thr	Gly	Lys	Leu	Ala	Leu	Asp	His	Ala	Asp	
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gaa	cga	gca	ctg	ggg	ctt	cac	ttg	ctt	cga	ttt	gct	gag	acg	gtg	gag	1728
Glu	Arg	Ala	Leu	Gly	Leu	His	Leu	Leu	Arg	Phe	Ala	Glu	Thr	Val	Glu	
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Ser	Val	Val	Ala	Met	Ala	Ala	Asn	Glu	Glu	Phe	Thr	Gly	Asn	Leu	Lys		
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Asp	Glu	Pro	Ser	Val	Glu	Pro	Leu	Val	Ala	Ala	Ser	Ala	Leu	Gly	Lys		
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Phe	Gly	Asp	Tyr	Gln	Cys	Asn	Asn	Ala	Met	Gly	Leu	Trp	Ser	Ile	Ile		
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 Thr Leu Ser Val Lys Arg Ala Val Val Asp Phe Ser Ser Pro Asn Ile
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 195 200 205
 Thr Leu Ala Arg Met Leu Glu Tyr Ser His Val Glu Val Leu Arg Arg
 210 215 220
 Asn His Val Gly Asp Trp Gly Thr Gln Phe Gly Met Leu Ile Glu Tyr
 225 230 235 240
 Leu Phe Glu Lys Phe Pro Asp Thr Asp Ser Val Thr Glu Thr Ala Ile
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 Gly Asp Leu Gln Val Phe Tyr Lys Ala Ser Lys His Lys Phe Asp Leu
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 Asp Glu Ala Phe Lys Glu Lys Ala Gln Gln Ala Val Val Arg Leu Gln
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 Gly Gly Asp Pro Val Tyr Arg Lys Ala Trp Ala Lys Ile Cys Asp Ile
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 Asp Gly Gly Phe Asn Tyr Ala Ser Thr Asp Leu Thr Ala Leu Trp Tyr
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gag cgg gcg atc gag gat gtg cct aag atc ttt aag gct gtg gat ctg	288

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Glu	Arg	Ala	Ile	Glu	Asp	Val	Pro	Lys	Ile	Phe	Lys	Ala	Val	Asp	Leu	
				85					90					95		
gac	ggt	gat	ggg	ttt	att	gat	ttc	agg	gag	ttt	att	gat	gca	tac	aag	336
Asp	Gly	Asp	Gly	Phe	Ile	Asp	Phe	Arg	Glu	Phe	Ile	Asp	Ala	Tyr	Lys	
			100					105					110			
aga	agt	ggt	ggg	att	agg	tct	tcg	gat	ata	cga	aat	tct	ttc	tgg	act	384
Arg	Ser	Gly	Gly	Ile	Arg	Ser	Ser	Asp	Ile	Arg	Asn	Ser	Phe	Trp	Thr	
		115					120					125				
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Phe	Asp	Leu	Asn	Gly	Asp	Gly	Lys	Ile	Ser	Ala	Glu	Glu	Val	Met	Ser	
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gtt	ctg	tgg	aag	ctt	ggt	gag	aga	tgt	agc	tta	gag	gac	tgc	aac	agg	480
Val	Leu	Trp	Lys	Leu	Gly	Glu	Arg	Cys	Ser	Leu	Glu	Asp	Cys	Asn	Arg	
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Met	Val	Arg	Ala	Val	Asp	Ala	Asp	Gly	Asp	Gly	Leu	Val	Asn	Met	Glu	
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gag	ttc	atc	aaa	atg	atg	tct	tcc	aac	aat	gtc	taa					564
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Ser	Gly	Leu	Ser	Ser	Pro	Gly	Pro	Gly	Gly	Phe	Ser	Gln	Pro	Ser	Val	
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Asn	Glu	Met	Arg	Arg	Val	Phe	Ser	Arg	Phe	Asp	Leu	Asp	Lys	Asp	Gly	
	50					55					60					
Lys	Ile	Ser	Gln	Thr	Glu	Tyr	Lys	Val	Val	Leu	Arg	Ala	Leu	Gly	Gln	
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Glu	Arg	Ala	Ile	Glu	Asp	Val	Pro	Lys	Ile	Phe	Lys	Ala	Val	Asp	Leu	
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Asp Gly Asp Gly Phe Ile Asp Phe Arg Glu Phe Ile Asp Ala Tyr Lys
100 105 110
Arg Ser Gly Gly Ile Arg Ser Ser Asp Ile Arg Asn Ser Phe Trp Thr
115 120 125
Phe Asp Leu Asn Gly Asp Gly Lys Ile Ser Ala Glu Glu Val Met Ser
130 135 140
Val Leu Trp Lys Leu Gly Glu Arg Cys Ser Leu Glu Asp Cys Asn Arg
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aac aaa aag tca aac aag aag cac gaa tca aat ggg aaa caa caa caa	96
Asn Lys Lys Ser Asn Lys Lys His Glu Ser Asn Gly Lys Gln Gln Gln	
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caa caa gac gtc gat ggt ggt ggt ggg tgt ttg aga tca tca tgg atc	144
Gln Gln Asp Val Asp Gly Gly Gly Gly Cys Leu Arg Ser Ser Trp Ile	
35 40 45	
tgc aag aat gca tcg tgt aga gct aat gtg cct aaa gaa gat tcc ttt	192
Cys Lys Asn Ala Ser Cys Arg Ala Asn Val Pro Lys Glu Asp Ser Phe	
50 55 60	
tgc aag aga tgt tct tgt tgt gtt tgt cat aat ttc gat gaa aac aag	240

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Cys 65	Lys	Arg	Cys	Ser	Cys 70	Cys	Val	Cys	His	Asn 75	Phe	Asp	Glu	Asn	Lys 80	
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gag Glu	ttc Phe	tgt Cys	ggc Gly 100	tta Leu	tcg Ser	tgt Cys	cac His	att Ile 105	gag Glu	tgt Cys	gct Ala	ttt Phe	cga Arg 110	gaa Glu	gtc Val	336
aaa Lys	gtt Val	ggt Gly 115	gtt Val	att Ile	gct Ala	ctt Leu	ggg Gly 120	aat Asn	ctg Leu	atg Met	aag Lys	ctt Leu 125	gat Asp	ggt Gly	tgt Cys	384
ttt Phe	tgt Cys 130	tgc Cys	tac Tyr	tca Ser	tgt Cys	ggc Gly 135	aaa Lys	gtt Val	tct Ser	caa Gln	att Ile 140	ctt Leu	gga Gly	tgt Cys	tgg Trp	432
aaa Lys 145	aag Lys	cag Gln	ctt Leu	gtg Val	gca Ala 150	gca Ala	aag Lys	gaa Glu	gca Ala	cga Arg 155	cga Arg	cgt Arg	gat Asp	gga Gly	ctg Leu 160	480
tgt Cys	tat Tyr	aga Arg	ata Ile	gat Asp 165	ttg Leu	ggt Gly	tat Tyr	aga Arg	ctg Leu 170	ttg Leu	aat Asn	ggg Gly	act Thr	agt Ser 175	cgg Arg	528
ttt Phe	agt Ser	gaa Glu	ttg Leu 180	cat His	gag Glu	att Ile	gtt Val	aga Arg 185	gct Ala	gct Ala	aag Lys	tct Ser	atg Met 190	ctg Leu	gag Glu	576
gat Asp	gaa Glu	gtt Val 195	gga Gly	cct Pro	ctt Leu	gat Asp	gga Gly 200	cct Pro	act Thr	gct Ala	aga Arg	act Thr 205	gat Asp	aga Arg	ggc Gly	624
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tct Ser 225	gca Ala	att Ile	aaa Lys	aag Lys	gca Ala 230	ggg Gly	gag Glu	ttg Leu	tca Ser	gcc Ala 235	aat Asn	gca Ala	ggt Gly	aga Arg	gat Asp 240	720
tta Leu	gtt Val	cca Pro	gct Ala	gcg Ala 245	tgc Cys	agg Arg	ttt Phe	cat His	ttc Phe 250	gaa Glu	gat Asp	att Ile	gca Ala	cca Pro 255	aag Lys	768
caa Gln	gtg Val	act Thr	ctt Leu 260	cgt Arg	ctg Leu	att Ile	gag Glu	cta Leu 265	cct Pro	agt Ser	gct Ala	gta Val	gaa Glu 270	tat Tyr	gat Asp	816
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gat Asp	gat Asp 290	tta Leu	ttt Phe	gtt Val	gat Asp	tgc Cys 295	agt Ser	aga Arg	act Thr	gag Glu	agg Arg 300	agg Arg	atg Met	gtg Val	ata Ile	912
tct Ser 305	gac Asp	ctt Leu	gag Glu	cct Pro	tgc Cys 310	acg Thr	gag Glu	tac Tyr	aca Thr	ttc Phe 315	cgt Arg	gtt Val	gtc Val	tct Ser	tac Tyr 320	960

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agc gtt gag ata ttg aaa cca gtg gat ggt aag gaa aag aga aca att	1056
Ser Val Glu Ile Leu Lys Pro Val Asp Gly Lys Glu Lys Arg Thr Ile	
	340 345 350
gat tta gta ggt aac gct cag ccc tca gat aga gag gag aaa agt agc	1104
Asp Leu Val Gly Asn Ala Gln Pro Ser Asp Arg Glu Glu Lys Ser Ser	
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att tcc tca aga ttt caa att ggg caa ctt ggg aag tat gtg cag ttg	1152
Ile Ser tca Arg Phe Gln Ile Gly Gln Leu Gly Lys Tyr Val Gln Leu	
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gct gaa gct cag gag gaa ggc ttg ctt gaa gcg ttt tac aat gta gat	1200
Ala Glu Ala Gln Glu Glu Gly Leu Leu Glu Ala Phe Tyr Asn Val Asp	
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act gag aaa att tgt gag ccg cca gag gaa gaa ttg cca cct cga agg	1248
Thr Glu Lys Ile Cys Glu Pro Pro Glu Glu Glu Leu Pro Pro Arg Arg	
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cca cat ggg ttt gat cta aat gta gtt tca gtg cca gac ttg aat gag	1296
Pro His Gly Phe Asp Leu Asn Val Val Ser Val Pro Asp Leu Asn Glu	
	420 425 430
gag ttc act cca cct gat tct tct gga ggt gaa gac aat gga gtg ccg	1344
Glu Phe Thr Pro Pro Asp Ser Ser Gly Gly Glu Asp Asn Gly Val Pro	
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cta aat tcg ctt gct gag gct gat ggt ggt gat cat gat gat aac tgt	1392
Leu Asn Ser Leu Ala Glu Ala Asp Gly Gly Asp His Asp Asp Asn Cys	
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gat gat gct gtg tct aac ggt aga cgg aag aac aac aac gac tgc ttg	1440
Asp Asp Ala Val Ser Asn Gly Arg Arg Lys Asn Asn Asn Asp Cys Leu	
	465 470 475 480
gtt ata tca gat gga agt ggt gat gat acc gga ttt gat ttc ctc atg	1488
Val Ile Ser Asp Gly Ser Gly Asp Asp Thr Gly Phe Asp Phe Leu Met	
	485 490 495
acc agg aag agg aaa gca att tca gac agt aat gac tca gag aac cac	1536
Thr Arg Lys Arg Lys Ala Ile Ser Asp Ser Asn Asp Ser Glu Asn His	
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gag tgt gac agt tcg tcg att gat gac act ctt gag aaa tgt gtg aag	1584
Glu Cys Asp Ser Ser Ile Asp Asp Thr Leu Glu Lys Cys Val Lys	
	515 520 525
gtg atc agg tgg ctg gag cgt gaa ggc cac att aaa aca aca ttc agg	1632
Val Ile Arg Trp Leu Glu Arg Gly His Ile Lys Thr Thr Phe Arg	
	530 535 540
gtc agg ttc ttg aca tgg ttc agc atg agc tca acc gct cag gag caa	1680
Val Arg Phe Leu Thr Trp Phe Ser Met Ser Ser Thr Ala Gln Glu Gln	
	545 550 555 560
tct gtt gtg agc aca ttt gtg cag act tta gag gat gat cca ggt agc	1728
Ser Val Val Ser Thr Phe Val Gln Thr Leu Glu Asp Asp Pro Gly Ser	
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Gln Gln Asp Val Asp Gly Gly Gly Gly Cys Leu Arg Ser Ser Trp Ile
 35 40 45

Cys Lys Asn Ala Ser Cys Arg Ala Asn Val Pro Lys Glu Asp Ser Phe
 50 55 60

Cys Lys Arg Cys Ser Cys Cys Val Cys His Asn Phe Asp Glu Asn Lys
 65 70 75 80

Asp Pro Ser Leu Trp Leu Val Cys Glu Pro Glu Lys Ser Asp Asp Val
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Glu Phe Cys Gly Leu Ser Cys His Ile Glu Cys Ala Phe Arg Glu Val
 100 105 110

Lys Val Gly Val Ile Ala Leu Gly Asn Leu Met Lys Leu Asp Gly Cys
 115 120 125

Phe Cys Cys Tyr Ser Cys Gly Lys Val Ser Gln Ile Leu Gly Cys Trp
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Cys Tyr Arg Ile Asp Leu Gly Tyr Arg Leu Leu Asn Gly Thr Ser Arg

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165

170

175

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 210 215 220
 Ser Ala Ile Lys Lys Ala Gly Glu Leu Ser Ala Asn Ala Gly Arg Asp
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 Leu Val Pro Ala Ala Cys Arg Phe His Phe Glu Asp Ile Ala Pro Lys
 245 250 255
 Gln Val Thr Leu Arg Leu Ile Glu Leu Pro Ser Ala Val Glu Tyr Asp
 260 265 270
 Val Lys Gly Tyr Lys Leu Trp Tyr Phe Lys Lys Gly Glu Met Pro Glu
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 Asp Asp Leu Phe Val Asp Cys Ser Arg Thr Glu Arg Arg Met Val Ile
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 Ser Asp Leu Glu Pro Cys Thr Glu Tyr Thr Phe Arg Val Val Ser Tyr
 305 310 315 320
 Thr Glu Ala Gly Ile Phe Gly His Ser Asn Ala Met Cys Phe Thr Lys
 325 330 335
 Ser Val Glu Ile Leu Lys Pro Val Asp Gly Lys Glu Lys Arg Thr Ile
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 Asp Leu Val Gly Asn Ala Gln Pro Ser Asp Arg Glu Glu Lys Ser Ser
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Glu Phe Thr Pro Pro Asp Ser Ser Gly Gly Glu Asp Asn Gly Val Pro
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Leu Asn Ser Leu Ala Glu Ala Asp Gly Gly Asp His Asp Asp Asn Cys
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Asp Asp Ala Val Ser Asn Gly Arg Arg Lys Asn Asn Asn Asp Cys Leu
465 470 475 480

Val Ile Ser Asp Gly Ser Gly Asp Asp Thr Gly Phe Asp Phe Leu Met
485 490 495

Thr Arg Lys Arg Lys Ala Ile Ser Asp Ser Asn Asp Ser Glu Asn His
500 505 510

Glu Cys Asp Ser Ser Ser Ile Asp Asp Thr Leu Glu Lys Cys Val Lys
515 520 525

Val Ile Arg Trp Leu Glu Arg Glu Gly His Ile Lys Thr Thr Phe Arg
530 535 540

Val Arg Phe Leu Thr Trp Phe Ser Met Ser Ser Thr Ala Gln Glu Gln
545 550 555 560

Ser Val Val Ser Thr Phe Val Gln Thr Leu Glu Asp Asp Pro Gly Ser
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Asn	Leu	Asp	Arg	His	Leu	Val	Phe	Pro	Ile	Phe	Glu	Phe	Leu	Gln	Glu	
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cgt	cag	ctt	tac	cct	gat	gag	cag	atc	ctg	aag	tct	aaa	atc	cag	ctt	144
Arg	Gln	Leu	Tyr	Pro	Asp	Glu	Gln	Ile	Leu	Lys	Ser	Lys	Ile	Gln	Leu	
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Val	Ser	Phe	Leu	Leu	Asn	Pro	Asn	Ala	Val	Gln	Glu	Leu	Arg	Ala	Asp	
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Cys	Ser	Asn	Leu	Glu	Arg	Ser	Leu	Ser	Ala	Leu	Trp	Gly	Lys	Leu	Ala	
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Arg	Leu	Lys	Glu	Ile	Ile	Asp	Ser	Lys	Phe	Phe	Ile	Ala	Val	Lys	Pro	
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ggt	gca	gaa	cag	gat	ttg	gtt	gat	gca	ttg	ggg	tat	ctg	aat	gcc	atc	672
Gly	Ala	Glu	Gln	Asp	Leu	Val	Asp	Ala	Leu	Gly	Tyr	Leu	Asn	Ala	Ile	
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Gln	Gln	Glu	His	Tyr	Ser	Tyr	Lys	Asp	Pro	Ile	Ile	Glu	Phe	Leu	Ala		
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Cys	Val	Phe	Val	Asn	Tyr	Asp	Phe	Asp	Gly	Ala	Gln	Lys	Lys	Met	Lys		
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Glu	Asp	Gly	Asn	Phe	Ser	Thr	Val	Pro	Leu	Arg	Asp	Glu	Phe	Leu	Glu		
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Ile	Asp	Met	Gly	Val	Leu	Ala	Glu	Lys	Leu	Asn	Leu	Asn	Tyr	Glu	Glu		
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gcc	gag	aga	tgg	att	gtg	aac	cta	atc	cgc	acc	tca	aag	ctt	gat	gcc	1104	
Ala	Glu	Arg	Trp	Ile	Val	Asn	Leu	Ile	Arg	Thr	Ser	Lys	Leu	Asp	Ala		
		355					360					365					
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Lys	Ile	Asp	Ser	Glu	Ser	Gly	Thr	Val	Ile	Met	Glu	Pro	Thr	Gln	Pro		
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Asn	Val	His	Glu	Gln	Leu	Ile	Asn	His	Thr	Lys	Gly	Leu	Ser	Gly	Arg		
385					390					395					400		
aca	tac	aag	tta	gtg	aat	cag	ctc	ttg	gaa	cac	aca	cag	gcg	caa	gca	1248	
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Thr	Arg																

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35 40 45

Leu Asn Gln Thr Asn Met Val Asp Tyr Ala Met Asp Ile His Lys Ser
50 55 60

Leu Tyr His Thr Glu Asp Ala Pro Gln Glu Met Val Glu Arg Arg Thr
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Glu Val Val Ala Arg Leu Lys Ser Leu Glu Glu Ala Ala Ala Pro Leu
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Val Ser Phe Leu Leu Asn Pro Asn Ala Val Gln Glu Leu Arg Ala Asp
100 105 110

Lys Gln Tyr Asn Leu Gln Met Leu Lys Glu Arg Tyr Gln Ile Gly Pro
115 120 125

Asp Gln Ile Glu Ala Leu Tyr Gln Tyr Ala Lys Phe Gln Phe Glu Cys
130 135 140

Gly Asn Tyr Ser Gly Ala Ala Asp Tyr Leu Tyr Gln Tyr Arg Thr Leu
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Cys Ser Asn Leu Glu Arg Ser Leu Ser Ala Leu Trp Gly Lys Leu Ala
165 170 175

Ser Glu Ile Leu Met Gln Asn Trp Asp Ile Ala Leu Glu Glu Leu Asn
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Arg Leu Lys Glu Ile Ile Asp Ser Lys Phe Phe Ile Ala Val Lys Pro
195 200 205

Gly Ala Glu Gln Asp Leu Val Asp Ala Leu Gly Tyr Leu Asn Ala Ile
210 215 220

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 Phe His Arg Lys Leu Ser Ile Asp Ala Lys Arg Phe Ala Asp Gly Cys
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Ser Ala Ala Glu Pro Ser Glu Val Glu Asp Pro Glu Glu Ala Glu Leu
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Lys Glu Lys Val Leu Arg Ala Ala Gln Asp Ala Val Ser Lys Gln Lys
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Gln Ile Thr Asp Ala Phe Asp Thr Glu Tyr Met Lys Leu Arg Gln Thr
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Ser Glu Met Glu Gly Pro Leu Asn Asp Ile Ser Val Ser Gly Ser Ser
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Asn Ile Asp Leu His Asn Pro Ser Thr Met Pro Val Thr Ser Thr Val
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Gln Thr Pro Glu Leu Phe Lys Gly Thr Leu Lys Glu Tyr Gln Met Lys
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Gly Leu Gln Trp Leu Val Asn Cys Tyr Glu Gln Gly Leu Asn Gly Ile
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Leu Ala Asp Glu Met Gly Leu Gly Lys Thr Ile Gln Ala Met Ala Phe
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Leu Ala His Leu Ala Glu Glu Lys Asn Ile Trp Gly Pro Phe Leu Val
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Phe Cys Pro Asp Leu Lys Thr Leu Pro Tyr Trp Gly Gly Leu Gln Glu
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Gln Asn Asn Met Ala Glu Leu Trp Ala Leu Leu His Phe Ile Met Pro
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His Phe Asn Ile Tyr Ser Pro Glu Tyr Ile Leu Lys Ser Ile Phe Pro
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Ser Asp Ser Gly Val Asp Gln Val Val Ser Gly Ser Gly Ala Phe Gly
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Asp	Thr	Val	Ile	Phe	Tyr	Glu	Ser	Asp	Trp	Asn	Pro	Thr	Leu	Asp
1295						1300					1305			
Leu	Gln	Ala	Met	Asp	Arg	Ala	His	Arg	Leu	Gly	Gln	Thr	Lys	Asp
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Glu	Thr	Val	Glu	Glu	Lys	Ile	Leu	His	Arg	Ala	Ser	Gln	Lys	Asn
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Thr	Val	Gln	Gln	Leu	Val	Met	Thr	Gly	Gly	His	Val	Gln	Gly	Asp
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Asp	Phe	Leu	Gly	Ala	Ala	Asp	Val	Val	Ser	Leu	Leu	Met	Asp	Asp
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Ala	Glu	Ala	Ala	Gln	Leu	Glu	Gln	Lys	Phe	Arg	Glu	Leu	Pro	Leu
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Gly Glu Ile Pro Lys Val Thr Ser Gly Asn Asp Tyr Asn His Phe Pro
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Ile Cys Leu Ser Ser Ser Arg Ser Gln Ser Ile Lys Lys Val Asp Gln
35 40 45

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Tyr Leu Pro Asp Asp Arg Ala Phe Thr Thr Ser Phe Ser Glu Ala Asn
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Phe Ile Asn Pro Ser Tyr His Ser Pro Ser Asn Ser Pro Cys Val Tyr
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115 120 125

Gln Arg Gln His Tyr Leu Pro His Ser Gln Pro Leu Ser His Tyr Gln
130 135 140

Ser Pro Met Thr Trp Arg Asp Ile Glu Glu Glu Asn Phe Gln Arg Leu
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420 425 430

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435 440 445

Tyr Ser Glu Gly Glu Gln Lys Gln His Leu Val Ser Glu Ile Ala Ser
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Asn Ala Leu Leu Leu Ser Gln Asp Pro Phe Gly Ile Asp Ala Asn Phe
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Phe Cys Arg Asn Tyr Val Leu Gln Tyr Val Phe Glu Leu Gln Leu Gln
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Gln	Trp	Leu	Met	Asn	Lys	Glu	Asp	Ile	Glu	Arg	Leu	Arg	Gly	Ala	Leu
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Pro	Arg	Cys	Glu	Val	Arg	Glu	Leu	Glu	Asn	Asn	Gly	Gln	Phe	Leu	Phe
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Leu	Glu	Asp	Gly	Val	Asp	Leu	Val	Ser	Ile	Ile	Lys	Arg	Ala	Tyr	Tyr
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Val	Arg	Ser	Leu	Ala	Gly	Ile	Pro	Ser	Glu	Gly	Pro	Val	Leu	Tyr	Val
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Gly	Asn	His	Met	Leu	Leu	Gly	Met	Glu	Leu	His	Ala	Ile	Ala	Leu	His
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<213> Arabidopsis thaliana

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Phe Ser Pro Leu Glu Cys Gly Ala Arg Ala Pro Glu Ser Pro Leu Leu
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Leu Tyr Leu Pro Gly Ile Asp Gly Thr Gly Leu Gly Leu Ile Arg Gln
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His Lys Arg Leu Gly Glu Ile Phe Asp Ile Trp Cys Leu His Phe Pro
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Val Lys Asp Arg Thr Pro Ala Arg Asp Ile Gly Lys Leu Ile Glu Lys
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Thr Val Arg Ser Glu His Tyr Arg Phe Pro Asn Arg Pro Ile Tyr Ile
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Val Gly Glu Ser Ile Gly Ala Ser Leu Ala Leu Asp Val Ala Ala Ser
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Asn Pro Asp Ile Asp Leu Val Leu Ile Leu Ala Asn Pro Val Thr Arg
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Phe Thr Asn Leu Met Leu Gln Pro Val Leu Ala Leu Leu Glu Ile Leu
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220

210

215

Pro Asp Gly Val Pro Gly Leu Ile Thr Glu Asn Phe Gly Phe Tyr Gln
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Ala Ser Pro Leu Thr Glu Met Phe Glu Thr Met Leu Asn Glu Asn Asp
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Ser Asn Leu Pro Thr Leu Ile Arg Ile Phe Pro Lys Asp Thr Leu Leu
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Gly Asn His Met Leu Leu Gly Met Glu Leu His Ala Ile Ala Leu His
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Phe Leu Lys Glu Arg Asn Ile Leu Leu Arg Gly Leu Ala His Pro Leu
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 465 470 475 480

Asp Leu Phe Arg Ile Ile Gly Ala Val Pro Val Ser Gly Met Asn Phe
 485 490 495

Tyr Lys Leu Leu Arg Ser Lys Ala His Val Ala Leu Tyr Pro Gly Gly
 500 505 510

Val Arg Glu Ala Leu His Arg Lys Gly Glu Glu Tyr Lys Leu Phe Trp
 515 520 525

Pro Glu His Ser Glu Phe Val Arg Ile Ala Ser Lys Phe Gly Ala Lys
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Ile Ile Pro Phe Gly Val Val Gly Glu Asp Asp Leu Cys Glu Met Val
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Leu Asp Tyr Asp Asp Gln Met Lys Ile Pro Phe Leu Lys Asn Leu Ile
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Glu Glu Ile Thr Gln Asp Ser Val Asn Leu Arg Asn Asp Glu Glu Gly
 580 585 590

Glu Leu Gly Lys Gln Asp Leu His Leu Pro Gly Ile Val Pro Lys Ile
 595 600 605

Pro Gly Arg Phe Tyr Ala Tyr Phe Gly Lys Pro Ile Asp Thr Glu Gly
 610 615 620

Arg Glu Lys Glu Leu Asn Asn Lys Glu Lys Ala His Glu Val Tyr Leu
 625 630 635 640

Gln Val Lys Ser Glu Val Glu Arg Cys Met Asn Tyr Leu Lys Ile Lys
 645 650 655

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Glu Met Leu Phe Ala Ala Ala Ile Asp Asp Glu Ala Asn Asn Ser Met	
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 Lys Asn Ile Lys Arg Arg Arg Asn Met Gly Leu Gln Asn Val Asn Gln
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Glu	Lys	Leu	Arg	Pro	Leu	Ala	Leu	Ser	Lys	Thr	Ala	Lys	Asn	His	
1400						1405					1410				
aac	gaa	tgg	aag	gga	ctc	tat	ggt	aga	ttg	gac	tgg	caa	gga	aac	4284
Asn	Glu	Trp	Lys	Gly	Leu	Tyr	Gly	Arg	Leu	Asp	Trp	Gln	Gly	Asn	
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tta	ccc	att	tcc	atc	acc	gat	ccg	cag	ccc	atg	ggt	aag	gtg	gga	4329
Leu	Pro	Ile	Ser	Ile	Thr	Asp	Pro	Gln	Pro	Met	Gly	Lys	Val	Gly	
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atg	tgc	ttc	cat	cca	gaa	cag	gac	aga	att	atc	act	gtc	cgt	gaa	4374
Met	Cys	Phe	His	Pro	Glu	Gln	Asp	Arg	Ile	Ile	Thr	Val	Arg	Glu	
1445						1450					1455				
tgc	gcc	cga	tct	cag	ggg	ttt	ccg	gat	agc	tat	gag	ttt	tca	ggg	4419
Cys	Ala	Arg	Ser	Gln	Gly	Phe	Pro	Asp	Ser	Tyr	Glu	Phe	Ser	Gly	
1460						1465					1470				
acg	aca	aaa	cac	aaa	cat	agg	cag	att	gga	aat	gca	gtc	cct	cca	4464
Thr	Thr	Lys	His	Lys	His	Arg	Gln	Ile	Gly	Asn	Ala	Val	Pro	Pro	
1475						1480					1485				
cca	ttg	gca	ttc	gct	ctc	ggt	cgg	aag	ctc	aaa	gaa	gcc	cta	tat	4509
Pro	Leu	Ala	Phe	Ala	Leu	Gly	Arg	Lys	Leu	Lys	Glu	Ala	Leu	Tyr	
1490						1495					1500				
ctc	aag	agt	tct	ctt	caa	cac	caa	tca	taa						4539
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		20						25				30			
Asn	Phe	Lys	Glu	Lys	Pro	Leu	Arg	Ile	Ser	Asp	Lys	Ser	Glu	Thr	Val
	35					40					45				
Glu	Ala	Lys	Lys	Glu	Gln	Asn	Val	Val	Glu	Glu	Ile	Val	Ala	Ile	Gln
50					55				60						
Leu	Thr	Ser	Ser	Leu	Glu	Ser	Asn	Asp	Asp	Pro	Arg	Pro	Asn	Arg	Arg
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Leu Thr Asp Phe Val₈₅ Leu His Asn Ser Asp₉₀ Gly Val Pro Gln Pro Val
 Glu Met Leu Glu₁₀₀ Leu Gly Asp Ile Phe₁₀₅ Leu Glu Gly Val Val₁₁₀ Leu Pro
 Leu Gly Asp₁₁₅ Asp Lys Asn Glu Glu₁₂₀ Lys Gly Val Arg Phe₁₂₅ Gln Ser Phe
 Gly Arg Val₁₃₀ Glu Asn Trp Asn₁₃₅ Ile Ser Gly Tyr Glu₁₄₀ Asp Gly Ser Pro
 Gly Ile Trp Ile Ser Thr₁₅₀ Ala Leu Ala Asp Tyr₁₅₅ Asp Cys Arg Lys Pro
 Ala Ser Lys Tyr Lys₁₆₅ Lys Ile Tyr Asp Tyr₁₇₀ Phe Phe Glu Lys Ala Cys
 Ala Cys Val Glu₁₈₀ Val Phe Lys Ser Leu₁₈₅ Ser Lys Asn Pro Asp₁₉₀ Thr Ser
 Leu Asp Glu₁₉₅ Leu Leu Ala Ala Val₂₀₀ Ala Arg Ser Met Ser₂₀₅ Gly Ser Lys
 Ile Phe Ser Ser Gly Gly Ala₂₁₅ Ile Gln Glu Phe Val₂₂₀ Ile Ser Gln Gly
 Glu Phe Ile Tyr Asn Gln₂₃₀ Leu Ala Gly Leu Asp₂₃₅ Glu Thr Ala Lys Asn
 His Glu Thr Cys Phe₂₄₅ Val Glu Asn Ser Val₂₅₀ Leu Val Ser Leu Arg Asp
 His Glu Ser Ser₂₆₀ Lys Ile His Lys Ala₂₆₅ Leu Ser Asn Val Ala₂₇₀ Leu Arg
 Ile Asp Glu₂₇₅ Ser Gln Leu Val Lys₂₈₀ Ser Asp His Leu Val₂₈₅ Asp Gly Ala
 Glu Ala Glu Asp Val Arg Tyr₂₉₅ Ala Lys Leu Ile Gln₃₀₀ Glu Glu Glu Tyr
 Arg Ile Ser Met Glu Arg₃₁₀ Ser Arg Asn Lys Arg₃₁₅ Ser Ser Thr Thr Ser
 Ala Ser Asn Lys Phe₃₂₅ Tyr Ile Lys Ile Asn₃₃₀ Glu His Glu Ile Ala₃₃₅ Asn

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Asp Tyr Pro Leu Pro Ser Tyr Tyr Lys Asn Thr Lys Glu Glu Thr Asp
 340 345 350
 Glu Leu Leu Leu Phe Glu Pro Gly Tyr Glu Val Asp Thr Arg Asp Leu
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 Pro Cys Arg Thr Leu His Asn Trp Ala Leu Tyr Asn Ser Asp Ser Arg
 370 375 380
 Met Ile Ser Leu Glu Val Leu Pro Met Arg Pro Cys Ala Glu Ile Asp
 385 390 395 400
 Val Thr Val Phe Gly Ser Gly Val Val Ala Glu Asp Asp Gly Ser Gly
 405 410 415
 Phe Cys Leu Asp Asp Ser Glu Ser Ser Thr Ser Thr Gln Ser Asn Val
 420 425 430
 His Asp Gly Met Asn Ile Phe Leu Ser Gln Ile Lys Glu Trp Met Ile
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 Glu Phe Gly Ala Glu Met Ile Phe Val Thr Leu Arg Thr Asp Met Ala
 450 455 460
 Trp Tyr Arg Leu Gly Lys Pro Ser Lys Gln Tyr Ala Pro Trp Phe Glu
 465 470 475 480
 Thr Val Met Lys Thr Val Arg Val Ala Ile Ser Ile Phe Asn Met Leu
 485 490 495
 Met Arg Glu Ser Arg Val Ala Lys Leu Ser Tyr Ala Asn Val Ile Lys
 500 505 510
 Arg Leu Cys Gly Leu Glu Glu Asn Asp Lys Ala Tyr Ile Ser Ser Lys
 515 520 525
 Leu Leu Asp Val Glu Arg Tyr Val Val Val His Gly Gln Ile Ile Leu
 530 535 540
 Gln Leu Phe Glu Glu Tyr Pro Asp Lys Asp Ile Lys Arg Cys Pro Phe
 545 550 555 560
 Val Thr Gly Leu Ala Ser Lys Met Gln Asp Ile His His Thr Lys Trp
 565 570 575
 Ile Ile Lys Arg Lys Lys Lys Ile Leu Gln Lys Gly Lys Asn Leu Asn
 Page 127

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Ala	Thr 610	Thr	Thr	Arg	Leu	Val 615	Asn	Arg	Ile	Trp	Gly 620	Glu	Phe	Tyr	Ser
Ile 625	Tyr	Ser	Pro	Glu	Val 630	Pro	Ser	Glu	Ala	Ile 635	His	Glu	Val	Glu	Glu 640
Glu	Glu	Ile	Glu	Glu 645	Asp	Glu	Glu	Glu	Asp 650	Glu	Asn	Glu	Glu	Asp 655	Asp
Ile	Glu	Glu	Glu 660	Ala	Val	Glu	Val	Gln 665	Lys	Ser	His	Thr	Pro 670	Lys	Lys
Ser	Arg	Gly 675	Asn	Ser	Glu	Asp	Met 680	Glu	Ile	Lys	Trp	Asn 685	Gly	Glu	Ile
Leu	Gly 690	Glu	Thr	Ser	Asp	Gly 695	Glu	Pro	Leu	Tyr	Gly 700	Arg	Ala	Leu	Val
Gly 705	Gly	Glu	Thr	Val	Ala 710	Val	Gly	Ser	Ala	Val 715	Ile	Leu	Glu	Val	Asp 720
Asp	Pro	Asp	Glu	Thr 725	Pro	Ala	Ile	Tyr	Phe 730	Val	Glu	Phe	Met	Phe 735	Glu
Ser	Ser	Asp	Gln 740	Cys	Lys	Met	Leu	His 745	Gly	Lys	Leu	Leu	Gln 750	Arg	Gly
Ser	Glu	Thr 755	Val	Ile	Gly	Thr	Ala 760	Ala	Asn	Glu	Arg	Glu 765	Leu	Phe	Leu
Thr	Asn 770	Glu	Cys	Leu	Thr	Val 775	His	Leu	Lys	Asp	Ile 780	Lys	Gly	Thr	Val
Ser 785	Leu	Asp	Ile	Arg	Ser 790	Arg	Pro	Trp	Gly	His 795	Gln	Tyr	Arg	Lys	Glu 800
Asn	Leu	Val	Val	Asp 805	Lys	Leu	Asp	Arg	Ala 810	Arg	Ala	Glu	Glu	Arg 815	Lys
Ala	Asn	Gly	Leu 820	Pro	Thr	Glu	Tyr	Tyr 825	Cys	Lys	Ser	Leu	Tyr 830	Ser	Pro

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Glu Arg Gly Gly Phe Phe Ser Leu Pro Arg Asn Asp Ile Gly Leu Gly
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Ser Gly Phe Cys Ser Ser Cys Lys Ile Lys Glu Glu Glu Glu Arg
850 855 860

Ser Lys Thr Lys Leu Asn Ile Ser Lys Thr Gly Val Phe Ser Asn Gly
865 870 875 880

Ile Glu Tyr Tyr Asn Gly Asp Phe Val Tyr Val Leu Pro Asn Tyr Ile
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Thr Lys Asp Gly Leu Lys Lys Gly Thr Ser Arg Arg Thr Thr Leu Lys
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Cys Gly Arg Asn Val Gly Leu Lys Ala Phe Val Val Cys Gln Leu Leu
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Asp Val Ile Val Leu Glu Glu Ser Arg Lys Ala Ser Asn Ala Ser Phe
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Gln Val Lys Leu Thr Arg Phe Tyr Arg Pro Glu Asp Ile Ser Glu Glu
945 950 955 960

Lys Ala Tyr Ala Ser Asp Ile Gln Glu Leu Tyr Tyr Ser His Asp Thr
965 970 975

Tyr Ile Leu Pro Pro Glu Ala Leu Gln Gly Lys Cys Glu Val Arg Lys
980 985 990

Lys Asn Asp Met Pro Leu Cys Arg Glu Tyr Pro Ile Leu Asp His Ile
995 1000 1005

Phe Phe Cys Glu Val Phe Tyr Asp Ser Ser Thr Gly Tyr Leu Lys
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Gln Phe Pro Ala Asn Met Lys Leu Lys Phe Ser Thr Ile Lys Asp
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Glu Thr Leu Leu Arg Glu Lys Lys Gly Lys Gly Val Glu Thr Gly
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Thr Ser Ser Gly Ile Leu Met Lys Pro Asp Glu Val Pro Lys Glu
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Met Arg Leu Ala Thr Leu Asp Ile Phe Ala Gly Cys Gly Gly Leu
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 Ile Glu Tyr Glu Glu Pro Ala Gly His Ala Phe Lys Gln Asn His
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 Ser Trp Ser Lys Val Gln Cys Glu Met Ile Leu Ala Phe Leu Ser
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 Lys Lys Phe Val Thr Tyr Asn Lys Gly Arg Thr Phe Gln Leu Thr
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 Leu Glu Ala Gly Thr Tyr Gly Val Ser Gln Pro Arg Lys Arg Val
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 Glu Pro Met His Val Phe Asp Asn Pro Gly Ser Lys Ile Ser Leu
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 Ala Pro Phe Arg Ser Ile Thr Val Arg Asp Thr Ile Gly Asp Leu
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Met Cys Phe His Pro Glu Gln Asp Arg Ile Ile Thr Val Arg Glu
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Cys Ala Arg Ser Gln Gly Phe Pro Asp Ser Tyr Glu Phe Ser Gly
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Leu	Leu	Met	Met	Phe	Gly	Tyr	His	Ile	Tyr	Leu	Trp	Tyr	Lys	Val	Arg	
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Thr	Thr	Cys	Ile	Leu	Leu	Cys	Ala	Gly	Leu	Ala	Ala	Val	Leu	Ser	Ser	
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Thr	Tyr	Ser	Ile	Lys	Lys	Pro	Leu	Asn	Asp	Ala	Val	Tyr	Gly	Ala	His	
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Gly	Asp	Phe	Thr	Val	Ala	Leu	Lys	Tyr	Val	Thr	Ile	Leu	Thr	Ile	Phe	
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Leu	Phe	Ala	Phe	Phe	Ser	His	Ser	Leu	Ser	Ile	Arg	Phe	Ile	Asn	Gln	
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Val	Asn	Ile	Leu	Ile	Asn	Ala	Pro	Gln	Glu	Pro	Phe	Ser	Asp	Asp	Phe	
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Gly	Glu	Ile	Gly	Ser	Phe	Val	Thr	Pro	Glu	Tyr	Val	Ser	Glu	Leu	Leu	
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gag	aaa	gct	ttc	ttg	ctc	aat	acg	gta	ggt	aat	agg	ctg	ttc	tac	atg	576
Glu	Lys	Ala	Phe	Leu	Leu	Asn	Thr	Val	Gly	Asn	Arg	Leu	Phe	Tyr	Met	
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ggc	ttg	cct	ttg	atg	cta	tgg	atc	ttt	ggg	cct	gtg	ctt	gtg	ttc	ttg	624
Gly	Leu	Pro	Leu	Met	Leu	Trp	Ile	Phe	Gly	Pro	Val	Leu	Val	Phe	Leu	
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Leu Leu Ser Asn Lys Glu Lys Gly Lys Val Asp Cys Asn Gly Gly Cys	
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Ser Trp Val Ala Ala Ile Met Lys Asp Asn Glu Lys Lys Asn Ile Leu	
50 55 60	
Ala Val Gln Thr Leu Arg Asn Thr Ile Met Gly Gly Thr Leu Met Ala	
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85 90 95	
Thr Tyr Ser Ile Lys Lys Pro Leu Asn Asp Ala Val Tyr Gly Ala His	
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Gly Asp Phe Thr Val Ala Leu Lys Tyr Val Thr Ile Leu Thr Ile Phe	
115 120 125	
Leu Phe Ala Phe Phe Ser His Ser Leu Ser Ile Arg Phe Ile Asn Gln	
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Gly Glu Ile Gly Ser Phe Val Thr Pro Glu Tyr Val Ser Glu Leu Leu
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Gly Leu Pro Leu Met Leu Trp Ile Phe Gly Pro Val Leu Val Phe Leu
 195 200 205

Ser Ser Ala Leu Ile Ile Pro Val Leu Tyr Asn Leu Asp Phe Val Phe
 210 215 220

Leu Leu Ser Asn Lys Glu Lys Gly Lys Val Asp Cys Asn Gly Gly Cys
 225 230 235 240

Asp Asp Asn Phe Ser Pro
 245